MULTIMEDIA UNIVERSITY ®

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, 2015/2016

PSP 0015 – PROBLEM SOLVING IN PROGRAMMING AND SYSTEM DESIGN

(Foundation in Information Technology)

15 OCTOBER 2015
2.30 p.m – 4.30 p.m
(2 Hours)

INSTRUCTIONS TO STUDENT

1. This question paper consists of **FOUR** printed pages.
2. Answer **ALL** questions.
3. Write your answers in the Answer Booklet.

Instructions: Answer **ALL** questions. Write your answers in the Answer Booklet.

QUESTION 1 [25 Marks]

a. List the **SIX** steps of Program Development Life Cycle.

(6 marks)

b. In the following problems, determine whether the algorithmic or the heuristic solution is the best solution approach for each of the problem. Justify your answer.
   i. To install a software in the computer
   ii. To find the fastest route from school to home
   iii. To find the average of three numbers
   iv. To choose which movie to watch
   v. To blow up a rubber balloon

(5 marks)

c. Which of the following are valid variable names? If it is not a valid variable name, state why.
   i. timeofDay = "4:30PM"
   ii. %GST = 6
   iii. myFirstCounter = 1
   iv. 6months = "yes"
   v. if = "true"

(5 marks)

d. Evaluate the following equations given the values A = 18, B = 6, and C = 2
   i. R = A > B AND A > B+C OR True AND False
   ii. R = NOT (True AND False) OR (B+C) < A
   iii. R = NOT True AND False OR B > A AND True

(6 marks)

e. Write the following equations in computer form.
   i. S^2 = 3R + 4Y/2
   ii. 2E = (18R)/2 – 5M
   iii. X + Y = 5M + (3R + 4)/2

(3 marks)

QUESTION 2 [25 Marks]

a. Using proper variable names and computer operator, set up an equation to calculate the number of minutes needed to bake a cake, when given as an input is the number of hours needed to bake a cake.

(4 marks)

b. Create an IPO chart for a program that determines how many full 250-strawberry containers of strawberry a gardener can pack when given as an input is the number of strawberry he has collected on a given day. Use the suitable variable names.

(6 marks)

c. Draw a flowchart to support your answer in Question 2 (b).

(6 marks)

d. Write a complete algorithm using positive logic structure for a program to determine the athlete's category for the standing long jump when the given input is the distance in meter with reference to the information in **Table 1** below:

Category	Distance in centimeter
Excellent	> 200
Average	200 – 165
Below average	< 165

Table 1

(9 marks)

QUESTION 3 [25 Marks]

a. Write a pseudocode and draw a flowchart (using modules) for a program that asks a user to enter a unit price and quantities of the product sold then calculate and display the total sale.

(13 marks)

b. Adrian wants to write a program that enables him to key in twenty (20) numbers and find out the biggest number. Write the pseudocode for this program using the automatic counter loop structure.

(6 marks)

c. City Mall charges its customers for parking their cars inside the car park building. The parking rates are set as $4 for the first 2 hours and $1 per hour for every subsequent hour afterwards. Draw a flowchart using the positive logic structure for the calculation of any car's parking fee.

(6 marks)

QUESTION 4 [25 Marks]

a. Describe how these loop structures work:
   i. While/While-End loop

   (2 marks)

   ii. Repeat/Until loop

   (2 marks)

b. Sime Property has its own rental system that involves the tenant and the owner of the property. These are the steps involved in its rental system:
   i. Owners will register their property in the system by filling in the ownership form.
   ii. The system will then advertise the property in its website.
   iii. Tenants will provide their information by filling in the agreement form.
   iv. Tenants pay the rent through the system and the system will update the payment status and inform the owner.

   Draw a context diagram for this system.

   (9 marks)

c. During the system development stage, members of the project team use several techniques to gather data and information. They need accurate data and information to keep the project on schedule, evaluate feasibility, and be sure the system meets the requirements. List and briefly explain **THREE** techniques used to gather data and information.

   (6 marks)

d. Data flow symbol represents one or more data items and it is represented by a line with a single or double arrowhead. List and briefly explain the **THREE** different types of error that can happen with incorrect combination of data flow and process.

   (6 marks)

End of Paper